



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,907	11/21/2003	Warren M. Farnworth	01-1059.2	4038
22823	7590	08/05/2005	EXAMINER	
STEPHEN A GRATTON THE LAW OFFICE OF STEVE GRATTON 2764 SOUTH BRAUN WAY LAKEWOOD, CO 80228			TRINH, MICHAEL MANH	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/719,907

Applicant(s)

FARNWORTH ET AL.

Examiner

Michael Trinh

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 76-113 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 76-89 and 97-113 is/are allowed.
- 6) ☒ Claim(s) 90,92-96 is/are rejected.
- 7) ☒ Claim(s) 91 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/21/03 & 3/17/04. 11312005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: IDS 1/03/2005

Art Unit: 2822

DETAILED ACTION

*** This office action is in response to filing of the application on November 21, 2003.

Claims 76-113 are current pending.

*** Specification page 1 should be updated to include the Patent No. 6,908,784 for the application 10/094,161.

Claim Objections

*** Claim 91 is objected for inconsistency since it recites different claimed terms for the same step. Specifically, claim 91, last step recites "forming a plurality of terminal contacts...in electrical communication with the die contacts"; whereas, claim 76 having the same processing step as claim 91 recites "forming a plurality of terminal contacts...in electrical communication with the conductive vias". Correction and clarification are respectfully requested.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 90,91-96 are rejected under 35 U.S.C. 102(b) as being anticipated Kuisl (6,020,217).

Re claim 90, Kuisl teaches (at Figs 2A-2F; col 4, line 1 through col 5) a method for fabricating a semiconductor components comprising at least the steps of: providing a plurality of semiconductor die 2 on a substrate 5 having a first side, a second side, and a thickness, the die comprising a plurality of die contacts 3 (Fig 2A); forming a plurality of conductive vias 7 in the dice in electrical communication with the die contacts 3 (Fig 2B); and etching the substrate to expose portions of the conductive vias 7/8 (Fig 2C; col 4, line 46 through col 5). Re claim

Art Unit: 2822

92, wherein the exposed portion of the conductive vias 7 comprises pin (Figs 2C,4). Re claim 93, wherein the exposed portions of the conductive vias 7 comprise pins in a pin grid array or micro pin grid array (Fig 4; col 5, lines 11-42). Re claim 94, wherein forming a plurality of conductors 8 on the second side in electrical communication with the exposed portions of the conductive vias 7 (Figs 2B-2C) and a plurality of terminal contacts 10 (Fig 2E) on the second side in electrical communication with the conductors 8 as shown in Figs 2B-2C. Re claim 95, wherein the terminal contacts 10 comprise balls or bumps in a ball grid array (Fig 2E-2F; 3B,4; col 5, lines 11-42). Re claim 96, wherein following the etching step the substrate has a second thickness of about less than about 100 microns (col 4, lines 24-39, lines 45-65), which thickness is within the claimed range of 10-250 microns.

Allowable Subject Matter

3. Claims 76-89,97-113 are allowed.
4. Claim 91 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter:
The references of record including Kuisl (6,020,217) alone or in combination, do not anticipatively disclose each and every aspect of the claimed method, or fairly make a prima facie obvious case of the claimed method, in combination with other processing claimed limitations,
as in claim 76, the inclusion of forming a plurality of polymer filled trenches on the first side between the dice having a depth less than the thickness; forming a plurality of conductive vias in the dice in electrical communication with the die contacts; thinning the substrate from the second side to expose the polymer filled trenches; forming a plurality of grooves through the polymer filled trenches to singulate the dice; and forming a plurality of terminal contacts on the dice in electrical communication with the die contacts;
as in claim 97, the inclusion of forming a plurality of trenches on the first side along peripheral edges of the dice, each trench having a depth less than the thickness; forming a plurality of contact bumps on the die contacts; forming a plurality of conductive vias in the

Art Unit: 2822

substrate in electrical communication with the contact bumps; forming a first polymer layer on the contact bumps and in the trenches to form polymer filled trenches; thinning the substrate from the second side to expose the polymer filled trenches; and singulating the dice through the trenches such that each component includes a semiconductor die covered on at least five sides by a portion of the first polymer layer, and portions of the polymer filled trenches; and

as in claim 105, the inclusion of forming a plurality of trenches along peripheral edges of the dice part way through the substrate; depositing a polymer material in the trenches; forming a plurality of contact bumps on the dice; forming a first polymer layer on the circuit side and the contact bumps; forming a plurality of conductive vias in the dice in electrical communication with the contact bumps; thinning the substrate from the back side to contact the polymer material in the trenches and to thin the back side; forming a plurality of terminal contacts on the back side or on the circuit side in electrical communication with the conductive vias; and singulating the dice by forming grooves through the trenches and the polymer material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-17



Michael Trinh
Primary Examiner